

Computer Programming IB

Levels:	Grades 10-12
Units of Credit:	0.50
CIP Code:	11.0201
Core Code:	35020000030
Prerequisites:	Computer Programming IA, Algebra I
Skill Test:	822 Computer Programming IB (C++)
	824 Computer Programming IB (Java)
	826 Computer Programming IB (VB)
	827 Computer Programming IB (Python)
	828 Computer Programming IB (C#)

COURSE DESCRIPTION

This is an intermediate class in computer programming/software engineering and applications. It reviews and builds on the concepts introduced in Computer Programming IA. Introduces students to more complex data structures and their uses, including sequential files, arrays, and classes. Students will learn to create more powerful programs. The skills test covers skills learned in Computer Programming 1A & 1B.

CORE STANDARDS, OBJECTIVES AND INDICATORS

STANDARD 7

Students will employ arrays.

Objective 1: Demonstrate the ability to use arrays in programs.

- a. Declare arrays all applicable types.
- b. Initialize arrays.
- c. Input data into arrays.
- d. Output data from arrays.
- e. Perform operations on arrays.
- f. Perform sequential searches on arrays.

Objective 2: Demonstrate the ability to use dynamic arrays (i.e. vectors, arraylists, or generic lists)

- a. Declare a dynamic array
- b. Add and remove items from the array
- c. Output data from arrays.
- d. Perform operations on arrays.
- e. Iterate through the loop (i.e. foreach loop)

Objective 3: Demonstrate the ability to use strings in programs.

- a. Compare string identifiers.
- b. Find the length of a string.
- c. Copy part or all of string identifiers into other strings.
- d. Concatenate string identifiers.
- e. Locate and delete sub-string positions.
- f. Insert strings into other strings.

STANDARD 8

Students will properly employ object-oriented programming techniques.

Objective 1: Demonstrate the ability to use classes.

- a. Instantiate objects.
- b. Use object data members.
- c. Use object member functions (methods).

Objective 2: Demonstrate the ability to create user-defined classes.

- a. Create and use data members.
- b. Create a constructor to initialize the data members.
- c. Create and use instance functions (methods).

Objective 3: Demonstrate proper design principles with classes

- a. Create classes that are well encapsulated (data members private).
- b. Properly use modifiers and accessors (getters and setters).
- c. Understand private and public modifiers

STANDARD 9

Students will properly use sequential files.

Objective 1: Demonstrate the ability to use sequential files in programs.

- a. Create and initialize sequential files.
- b. Store data to sequential files.
- c. Retrieve data from sequential files.
- d. Update sequential files.

STANDARD 10

Students will apply appropriate programming skill as an effective member of a team.

Objective 1: Demonstrate the ability to apply knowledge to a programming project.

- a. Formalize specifications.
- b. Choose proper input parameters.
- c. Choose appropriate data structures and processing.
- d. Design appropriate output.
- e. Use appropriate test data.
- f. Write good documentation.

Objective 2: Demonstrate the ability to use teamwork and collaboration in a programming project.

- a. Divide a project among programmers.
- b. Present work to a group.
- c. Coordinate work with others in the group.
- d. Complete assigned work according to predetermined deadlines.
- e. Participate in a peer performance evaluation.
- f. Demonstrate professionalism in team relationships, communication, timeliness, and attitude.